REMARKS

This paper is being provided in response to the Final Office Action dated April 2, 2007, for the above-referenced application. Applicants respectfully request consideration of the following remarks.

The rejection of claims 15-20 under 35 U.S.C. 101 as being non-statutory subject matter was previously addressed by amendments in the response to the prior Office Action. Claim 15 was previously amended to recite computer software stored on a computer-readable medium; the remaining claims 16-20 depend therefrom. Applicants submit that the claims recite statutory patentable subject matter as provided under the MPEP. Specifically, MPEP 2106(IV)(B)(1) states as follows:

> "[F]unctional descriptive material" consists of data structures and computer programs which impart functionality when encoded on a computer-readable medium. (The definition of "data structure" is "a physical or logical relationship among data elements, designed to support specific data manipulation functions." The New IEEE Standard Dictionary of Electrical and Electronics Terms 308 (5th ed. 1993).)...*When functional descriptive material is recorded on some computer-readable medium it becomes structurally and functionally interrelated to the medium and will be statutory in most cases.* (emphasis added)

Accordingly, Applicants respectfully submit that the claims recite statutory subject matter and that the rejection should be reconsidered and withdrawn.

.The Office Action has maintained the rejection of claims 1 and 15 under 35 U.S.C. 112, second paragraph, as being incomplete. Applicants traverse this rejection. The Office Action indicates that there is no relation between the features "1" and "2" of claims 1 and 15 and

suggests that a "structural cooperative relationship" is required. Applicants point out that claim 1 recites a <u>method</u> claim for handling a writing of new data (and claim 15 claim directed to computer software stored on a computer-readable medium embodying the method). In one step, a journal entry is created that points to a first storage location containing old data to be replaced by the new data, wherein the journal entry is maintained after writing the new data. In another step, new storage space is allocated having a second storage location. It is noted that despite being identified as in the Office Action as steps "1" and "2", these steps are not necessarily performed in this order. In yet another step, the new data is written to the storage space at the second storage location, wherein the old data is maintained in the first storage location after writing the new data to the new storage space at the second storage location. As noted above, the journal entry pointing to the first storage location of the old data is also maintained.

Applicants submit that there is no missing step between the features identified by the Office Action as "1" and "2." The Office Action's reference to "necessary structural connections" seems to be directed to that of elements of an <u>apparatus</u> claim. Applicants submit that applying this requirement to process claims is not proper. Rather, as noted above, Applicants recite steps of a method that are performed to handle write of new data. There is no omitted step that is necessary for reciting the claimed invention. The Office Action cites to MPEP 2172.01 in the rejection; however, MPEP 2172.01 makes clear the point that it is not required that functional elements be directly functionally related or directly intercooperate, but rather may serve independent purposes in the context of the claimed invention. Specifically, MPEP 2172.01 states the following:

> *Ex parte Huber,* 148 USPQ 447, 448-49 (Bd. Pat. App. 1965) (A claim does not necessarily fail to comply with 35 U.S.C. 112, second paragraph where the various

elements do not function simultaneously, are not directly functionally related, do not directly intercooperate, and/or serve independent purposes.).

Applicants recite a method, and software implementation stored on a computer-readable medium, that includes at least three functional steps that recite the presently claimed process for handling the writing of new data. Accordingly, in view of the above, the requirement in the Office Action that the features "1" and "2" must be linked "structurally" and that, absent this, the claims 1 and 15 are rendered incomplete, is misplaced and refuted by the explicit language of the MPEP with respect to claimed functional steps. Accordingly, Applicants submit that the claims are definite and complete and that the rejection of the claims should be reconsidered and withdrawn.

The rejection of claims 1-2, 9-11, 14-17, 20-21, 26, 32 and 34 under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 7,047,355 to Nakatani, et al. (hereinafter "Nakatani") is hereby traversed and reconsideration is respectfully requested.

Independent claim 1 recites a method of handling writing new data. The method includes creating a journal entry that points to a first storage location containing old data to be replaced by the data new data. The journal entry is maintained after writing the new data. New storage space is allocated having a second storage location. The new data is written to the new storage space at the second storage location. The old data is maintained in the first storage location after writing the new data to the new storage space at the second storage location. Claims 2-14 depend directly or indirectly from independent claim 1.

Independent claim 15 recites computer software, stored on a computer-readable medium,

that handles writing new data. The software includes executable code that creates a journal entry that points to a first storage location containing old data to be replaced by the new data. The journal entry is maintained after writing the new data. Executable code allocates new storage space having a second storage location. Executable code writes the new data to the new storage space at the second storage location. The old data is maintained in the first storage location after writing the new data to the new storage space at the second storage location. Claims 16-20 depend directly or indirectly from independent claim 15.

Independent claim 21 recites a method of restoring data to a storage device. The method includes accessing a journal having a plurality of entries. Each of the entries points to prior data that existed on the storage device before a write caused the entry to be created. There is an entry in the journal for each data write to the storage device that occurred after an initial time. The prior data corresponding to each of the plurality of entries in the journal is maintained in the storage device after each new data write after the initial time. Each of the entries is used to remap the storage device to point to the prior data. Claims 22-27 depend directly or indirectly from independent claim 21.

Independent claim 32 recites a journal used for continuous backup of a storage device. The journal includes a first entry that points to a first storage location containing old data replaced by new data written to the storage device. A plurality of additional entries point to respective additional storage locations containing old data replaced by new data written to the storage device. For every write to the storage device that occurs after an initial time, there is a corresponding entry. The old data corresponding to the first entry and each of the plurality of

additional entries is maintained in the storage device after each new write to the storage device after the initial time. Claims 33 and 34 depend directly from independent claim 32.

The Nakatani reference discloses an updated data write method using a journal log. Nakatani discloses that a server, including a buffer memory, and a storage system write journal logs and execute flush processing. Nakatani discloses that a journal log is provided to separately store a file update history in the storage system because the contents of data updating executed in the buffer memory of the server may be lost because of a failure before data is updated in the storage area in the storage system. (See col. 7, lines 39-45 of Nakatani.) The Office Action cites to col. 6, lines 4-27 of Nakatani in which is disclosed the use of pointers to manage the status of a journal log storing area after flush processing.

Applicants recite a system for managing data writes that include a journal that keeps track of all of the old data storage areas corresponding to each write of new data to a storage device. Applicants refer to FIGS. 5, 6 and 7 of the originally-filed specification in which is shown a series of new writes to a storage device and the corresponding use of journal entries to keep track of the *locations of old data* in the storage device. Accordingly, Applicants' claimed invention provides a method and device for continuous data backup in which a storage device can easily be restored to an earlier state through the use of maintained journal entries and stored old data that is maintained in the storage device. (See, for example, page 14, line 8 to page 15, line 4 of the originally-filed specification.)

The Office Action cites to Figures 4 and 6, col. 8, lines 30-34 and col. 9, lines 61-65 of

Nakatani as disclosing "writing the new data to the new storage space at the second location, wherein the old data is maintained in the first storage location after writing the new data to the new storage space at the second storage location." However, these portions of Nakatani disclose allocation of an area of a required size for a journal log area and then incrementing an end pointer in a buffer memory by the size of the allocated area. Nakatani discloses using data in the journal logs to execute flush processing in which updated data is read from the journal log storing area into a cache. (See Col. 5, lines 6-13 of Nakatani). Nakatani specifically discloses that

> When the server 1 receives the flush processing completion notification from the storage system 2, the file system manager 12 dequeues the dirty data, which is stored in the buffer memory of the server 1, from the dirty queue. As a result, the storage area in the buffer memory 13 where the dirty data has been stored is released for use in storing other data. (Col. 5, lines 38-44 of Nakatani)

Thus, Nakatani does not disclose maintaining old data in a first storage location after writing of new data to a new storage space at a second storage location as is claimed by Applicants.

Furthermore, Nakatani 's journal log is disclosed as being provided for new data written to a buffer memory of a storage device before being written to a storage system. Nakatani states:

> The journal log is provided to separately store a file update history in the storage system 2 because the contents of data updating executed in the buffer memory 13 of the server 1 may be lost because of a failure before data is updated in the storage area in the storage system 2. Therefore, the journal log is not necessary once data is updated in the storage area of the storage system 2. (Col. 7, lines 39-45 of Nakatani.)

Nakatani discloses a journal log system in which *new updated data* that is to be written to a storage system is first stored in a buffer memory in storage locations that are logged into a journal. That is, the journal log disclosed by Nakatani is for ensuring the correct writing of *new data* to a storage device in the event of a failure before the new data is updated in the storage

area.

Accordingly, Applicants submit that Nakatani does not disclose a system that allows for restoring of a storage device to an earlier state by using journal entries to maintain pointers to storage locations of old data that is to be replaced by the writing of new data and in which the old data is maintained in the first storage location after the new data is written to a second storage location, as is claimed by Applicants. In view of the above, Applicants respectfully request that the rejection be reconsidered and withdrawn.

The rejection of claims 3-8, 12-13, 18-19, 22-25, 27 and 33 under 35 U.S.C. 103(a) as being unpatentable over Nakatani in view of U.S. Patent No. 7,013,379 to Testardi (hereinafter "Testardi") is hereby traversed and reconsideration is respectfully requested. It is, once again, noted that some paragraphs set forth in the Office Action appear to refer to a "Sakuraba" reference (paragraphs 18, 19, 20, 21, 22, 23, 24 and 25 of the Office Action). It is believed that, where cited in the Office Action, "Sakuraba" is meant to refer to the Nakatani reference.
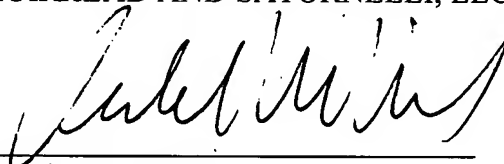
The features of independent claims 1, 15, 21 and 32 are discussed above with respect to Nakatani. Claims 3-8, 12-13, 18-19, 22-25, 27 and 33 depend therefrom.

The Testardi reference discloses techniques in a computer system for handling data operations to storage devices. The Office Action cites to Testardi as disclosing the use of a switch that handles data operations to a storage device.

Applicants respectfully submit that Testardi does not overcome the above-noted deficiencies of the Nakatani reference with respect to Applicants' claimed invention. Accordingly, Applicants submit that neither Nakatani nor Testardi, taken alone or in any combination, teach or fairly suggest at least the above-noted features as claimed by Applicants. In view of the above, Applicants respectfully request that the rejection be reconsidered and withdrawn.

Based on the above, applicant respectfully requests that the Examiner reconsider and withdraw all outstanding rejections and objections. Favorable consideration and allowance are earnestly solicited. Should there be any questions after reviewing this paper, the Examiner is invited to contact the undersigned at 508-898-8603.

Respectfully submitted,
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